REMARKS

Applicant and his attorney thank Examiner Ogden for the interview on March 16, 2005. With this amendment almost all of the claims have been amended, independent method claim 17 has been cancelled, and claims 25 through 44 have been added. Independent claims 1 (a heat transfer system), 10 (a heat transfer fluid composition), 25 (a method of cooling a heat exchange system), 26 (a heat transfer fluid composition/consisting essentially of), 33 (a method of cooling a heat exchange system/consisting essentially of-), 41 (a method of cooling a heat exchange system/negative limitation no non-PG soluble additives), and 43 (a heat transfer fluid composition/negative limitation no non-PG soluble additives) are pending. All of the claims are different from which were pending before the Board's decision mailed May 30, 2003 and which was faxed on March 14, 2005 to the Examiner prior to the interview.[1] A copy of the claims before the Board were brought to the interview. This amendment describes the discussion at the interview. Also at the interview, the examiner raised a question concerning copending applications. With this amendment, applicant is filing an information disclosure statement describing his copending applications and art cited therein. This art is no better, and really not as good as the art already of record.

The Past Board Decision, The Present Claims and The Present Record

As asserted by the applicant at the interview, the Board's decision with a full copy of the references Coughenour et al. and Dingley (as opposed to the abstract of these references), invited an evaluation of how references should be viewed and combined. This is especially the case in view of the full copies of Coughenour et al and Dingley which had not been transmitted to the applicant by the examiner then handing this application. In short, even though the Board affirmed the examiner's rejection of the then pending claims, the Board presented the applicant and the examiner currently handling this application with an interesting situation when it stated as to the combination of the then cited Reny, Evans, Masciolil, Greaney and Uekusa references:

[1]In the same fax applicant also transmitted the full text articles by Coughenour et al. and Dingley discussed herein.

> these issues are not ripe for consideration since neither the appellant nor the examiner has considered all relevent evidence for the reasons discussed below.[2]

The Board then went on to note the importance of the full text Coughenour and Dingley references and rhetorically asked how these would have affected a motivation to combine references.

> The examiner apparently obtained the full text Coughenour and Dingley articles in July, 2000, but does not rely on the full test articles, nor are they even mentioned in the Examiner's Answer or the Appreal brief (FN It is unclear whether appellant has review the full test of the articles. Copies of these articles are being provided as attachments to this Decision.). ***Our decision is, therefore, based solely on the argument of the examiner and appellant with respect to the Chemical Abstracts***. We have, however, reviewed the full text articles and note that the examiner's position regarding the motivation to combine Coughenour and Dingley with the secondary references is further supported by the full text Dingley and Coughenour articles which discuss the importance of low corrosivity in engine coolant compositions. See, e.g., Dingley, page 1, paragraph 2 and Coughenour, page 90, column 1, first full paragraph.
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> In the event that appellant elects to continue prosecution, the Reny and Evans disclosures should be considered in light of the full text Coughenour article. Specifically, in the full test article, Coughenour discloses testing of coolants comprising 100% propylene glycol, a 50/50 propylene glycol and water composition, and 100% water. ***Coughenour concludes '[n]on-aqueous propylene glycol demonstrates extremely good engine cooling system corrosion protection and cylinder liner cavitation suppression.' Page 96, first column.*** The examiner and appellant should consider whether one of ordinary skill in the art would have been motivated to exclude water from the compositions of Reny or Evans in view of Coughenour's teaching. Board's Decision at page 9-10, emphasis added.

In view of the Board's statements, applicant with his declaration, attached hereto as Exhibit A, is presenting a new record as to the effect of the full text of the Coughenour and Dingley articles. ***These articles by the Board's own observations were not the subject of the Examiner's or the applicant's briefs in the parent application hereto.*** The latter fact is extremely important because the Coughenour and Dingley articles bring out the full state of the art as of 1993 to which this application pertains as of 1993. The full state of the art in view of Coughenour and Dingley (which helps the applicant as to patentability) was not known by the Board and is explained in applicant's declaration.

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[2]The examiner has applied the same combination of references in his last office action.

Not only are there more claims in this application than what was before the Board, all of the method claims of the instant application are different from the eight method claims reviewed by the Board. The claims before the Board are attached hereto as Exhibit B.

The State Of The Art As Of 1993-Workers Feared Water Which Required Additives, Or Thought Additives Were Not Needed Because A Pure Propylene Glycol Coolant Protected An Engine Against Corrosion

1. Coughenour, Dingley And The Evans References.

With respect to propylene glycol coolants as of 1993, those with ordinary skill would have been taught either (a) a fear of water, and hence, buffering and corrosion inhibition additives were needed (see US Pat. 4,550,694 to Evans at column 13, lns34-40 "Water is considered to be an undesirable constitutent. . .")[3], or (b) a person of ordinary skill would have thought such additives would not have been necessary in a coolant where there was no water with which to create a corrosion or cavitation problem (See the Coughenour and Dingley articles)[4]. Hence, there was two "schools of thought," a propylene glycol system had water no matter how hard you tried to get rid of it and you needed a buffered system with corrosion inhibition additives. A second school of thought was that a system with pure propylene glycol protected a cooling system from corrosion and no additive were needed. What was surprising and unexpected was that such corrosion inhibition additives would have been needed in a neat or non-aqueous coolant system where heat and propylene glycol created an unexpected corrosion problem. See paragraph 5 of the declaration.

Because of a fear of water for one of ordinary skill in the art as of 1993, such a person would not have understood the cited Evans '579 patent to suggest the use of 100% propylene glycol with corrosion inhibition additives and without the use of a buffer. Buffers reduce or control corrosive acidity for a commercially viable water containing coolant. Instead, one of ordinary skill in the art would have added a buffer along with corrosion inhibition additives to

[3]Also see US Pat. 5,031,579 to Evans (cited in the last office action) which also teaches one of ordinary skill the fear of water in a propylene glycol cooling system. In the '579 patent a desiccant material is even used to make sure that the coolant in the system remains moisture free. See column 10, lines 55-68.

[4]Coughenour concludes '[n]on-aqueous propylene glycol demonstrates extremely good engine cooling system corrosion protection and cylinder liner cavitation suppression.' Page 96, first column.

the propylene glycol of the '579 patent because one of ordinary skill would expect that a buffer would be needed to reduce or control acidity by virtue of water in the coolant at least from the hygroscopic nature of propylene glycol. One of ordinary skill in the art, based on the '579 patent, would not have used a non-buffered propylene glycol composition which also included corrosion inhibition additives. This is because there was a belief that high acidity associated with even trace amounts of water in a propylene glycol coolant composition, which was thought to normally result from gradual absorption of water during use in an engine, caused an unacceptable risk of corrosion. That is why some of Evans' cooling systems even used a desiccant. See footnote 3.

At about the time of the '579 patent and a bit later, Coughenour knowing about the '579 patent (see page 1 and footnote 6 of that article which cites the '579 patent) concluded that propylene glycol demonstrated extremely good engine cooling system corrosion protection and cylinder liner cavitation. This conclusion and the Coughenour and Dingley articles suggest that 100% propylene glycol would not need corrosion inhibitor additives and a person having ordinary skill would not want to add corrosion inhibitors that were not needed because as stated by Coughenour "chemical addition should be greatly simplified." This was the second "school of thought."

2. The Reny Reference

The Examiner cited PCT/US89/01544 (Reny et al.) and recognized that it does not exemplify a coolant with less than 0.5 weight percent water. Indeed, Reny's compositions can have almost 10 weight percent water which would have been feared as corrosive and would have been viewed as needing buffers and corrosive inhibiting additives.

At page 2, line 18, Reny describe two of Evans patents USP Nos. 4,550,694 and 4,630,572 and says these patents related to systems with little or no water. That is not true, propylene glycol systems were thought to have water in them. Both of these patents describe propylene glycol cooling systems, but because propylene glycol is miscible with water, it was thought such systems were hygroscopic and were assumed to have water present. See column 17, lines 26-33 of the '694 patent which says:

> If the coolant is miscible with water and a small amount of water is in solution with the coolant, most of the coolant vapor will condense within coolant liquid that is lower in temperature than the saturation temperature of the coolant and higher in temperature

> than the saturation temperature of water, but not all of it. Coolants miscible with water are hygroscopic and should be assumed to contain some water.

In the same paragraph describing the Evans patents (which assumed propylene glycol coolants had water), Reny said that "uninhibited glycols used as anhydrous coolants are corrosive to a typical cooling system components..." As stated in the attached declaration, a person of ordinary skill would have understood Reny as seeing such systems as corrosive because they were assumed to have water in them as an undesirable element. See column 13, lines 34-41 of the Evans '694 patent. At least a portion of those skilled in the art (except for those like Coughenour and Dingley) thought "anhydrous propylene glycol systems" had water in them because they were hygroscopic.

In any event, even if Reny did mean that the propylene glycol systems he was referring to were completely without water, he did not suggest any corrosion inhibitors that would work in systems that had essentially no water. See attached declaration paragraph 11.

3. Mascioli, Greaney and Uekusa

The Examiner cited Masciioli, Greaney and Uekusa in combination with Coughenour, Dingley or Evans '579 in rejecting the previously pending claims as obvious. Masciioli, Greaney and Uekusa describe the use of molybdate, nitrate or azole compounds in an **aqueous** coolant. As of the time of the filing of the parent of the instant application in 1993, a person having ordinary skill would have not understood Mascioli, Greaney and Uekusa to suggest adding corrosion inhibition additives, such as molybdates, nitrates or azoles **without buffering**, to a completely non-aqueous coolant because of the schizophrenic nature of the understandings of the cooling art. There was either a fear of water even for systems which had nearly no water, and hence, buffering and corrosion inhibition additives were needed. Alternatively the "wisdom" of Coughenour and Dingley, was additives would not have been necessary in a coolant where there was no water with which to create a corrosion or cavitation problem. Indeed, according to Coughenour and Dingley a "neat" system protected against corrosion. In short a person of ordinary skill would have no motivation of adding corrosion inhibition additives to a "neat" system ***without buffering.*** Applicant submits that Mascioli, Greaney and Uekusa do not combine with any cited reference to render the pending claims obvious.

In 1993 A Person Of Ordinary Skill Would Not Have Added Corrosion Inhibitor Additives Unless He Thought He Had To.

If a person of ordinary skill as of 1993 concluded that despite being hygroscopic, a system with 100% propylene glycol did not need corrosion inhibition additives (especially in view of Coughenour and Dingley), that person would not have added corrosion inhibition additives because they could be deleterious to a cooling system. Why add additives if they were not needed? Additives react with each other causing problems; if they were not needed, why invite a problem. Additives also were known to not stay in solution/suspension without water. Again a person would not wanted to invite this problem. Finally additives were known to have a tendency not to stay in solution/suspension without balancing their relative amounts and agitation -- another problem if additives were added to a system if they were not needed. Moreover the latter problem could not be cured with a simple agitation gained from starting the engine. That is because when the additives fall out of solution/suspension, they congeal in the cooling system.

The Coolant Of The Invention Is Surprisingly Stable–The Additives Don't Congeal

With the non-buffered propylene glycol coolant of the invention, surprisingly the additives do not fall from solution/suspension without water. Additives commonly fall and congeal in aqueous systems. The coolant of the invention can be stored for years without congealing. Surprisingly the additives also do not fall from solution/suspension during use because of a lack of water or an imbalance in relative additive amounts where the imbalance has developed over time and use. In a test vehicle, applicant has run the non-buffered coolant of the invention for about 1,000,000 miles without significant loss of additives, without the additives falling out of solution/suspension and without significant corrosion of the components which are in contact with the coolant.

Conclusion

Applicant has discovered a "neat" propylene glycol coolant system that is extremely low in water, needs no buffering, but needs specific additives soluble in the propylene glycol to protect the system from the propylene glycol corrosion. The resultant coolant is surprising

effective and stable. In view of the foregoing, applicant respectfully requests the examiner reconsider and allow the pending claims.

Respectfully submitted,
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